CHAPTER 3

SHIPS SANITATION

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INTRODUCTION

Everyone aboard ship should expect and find sanitary facilities, supplies, and healthful conditions in his or her shipboard environment. All crewmembers have a responsibility for the state of that environment. Proper sanitation is impossible unless each member cooperates. The Master should ensure the good sanitary conditions of the vessel through periodic inspections.

Ensuring the health and safety of persons aboard a ship requires knowing and understanding the various factors on the ship that affect health. Preventing and controlling environmental health and safety problems will help to ensure the safety of the crew and the ship. This section will cover those factors, including food sanitation, potable water, pest management, laundry, barbershops, habitability, thermal stress, hazardous materials, respiratory protection, and confined spaces. By making the described practices an integral part of the ship's routine, the Master and crew can contribute to the health, safety, and success of each journey.

FOOD SANITATION

Today, most foodborne illness is related to infectious disease. Most of the toxins of the past – such as the use of copper to color home canned green beans and lead solder to repair pots and pans – have been eliminated. Foodborne illness can be especially serious aboard ship, since nearly everyone eats from the same mess and contamination can infect an entire crew. There is much that can be done to prevent a foodborne illness from occurring. Proper food procurement, storage, and preparation, along with personal hygiene, and sanitary food preparation areas go along way to ensuring the safety of the food served in the galley. All personnel who are assigned to work in the galley, even for a short period of time, must be trained in food sanitation and personal hygiene.

The U.S. Food and Drug Administration (FDA) has developed a Food Code. It was developed primarily for shore-based facilities, but it also can assist the mariner in providing a system of safeguards to minimize foodborne illness aboard ship. The current Food Code is available in hard copy by calling the National Technical Information Service at 703-605-6000 or 1-800-553-NTIS (6847) or online at http://www.cfsan.fda.gov/~dms/foodcode.html.

When an outbreak of disease is occurring aboard ship, even if the source of the outbreak cannot be determined, interrupting the most likely route of transmission may prevent further spread to uninfected shipmates. The Center for Disease Control and Prevention (CDC) has guidelines on conducting a foodborne illness outbreak investigation, should one occur (http://www.cdc.gov/ncidod/dbmd/outbreak/). Information should be printed in advance should it be needed.

The Food Handler

In addition to cross contamination (discussed later under "Food Preparation and Handling"), galley workers can inadvertently contaminate food if they do not follow proper personal hygiene. Frequent hand washing is the key to preventing contamination. A separate hand washing sink with hot and cold running water, a sanitary soap dispenser, and disposable towels should be provided in the galley. Personnel must wash their hands after each use of toilet facilities, after eating, drinking, or smoking, and after handling raw food. A sign to remind personnel to wash their hands should be placed in the head used by galley personnel. Personnel should wash hands periodically, even if one of these activities has not occurred.

Galley workers must bathe at least once a day. Clothing must be maintained in a clean and sanitary condition and soiled clothing must not be allowed in the galley. Aprons should only be used while working in the galley and be replaced each day, or more often if necessary. Disposable gloves should be worn when handling food. Gloves do not change the need for hand wahing.

Food handlers should have a thorough physical examination at least once a year. At all times, they should be free of any infectious disease. Respiratory diseases and those transmitted by the fecal-oral route are especially hazardous. Any galley worker who is sick must be removed from all galley duties and be evaluated prior to reassignment to the galley. Skin infections and open wounds also prevent personnel from working in the galley until the skin is completely healed.

Food Service Facilities, Equipment, and Utensils

All food service facilities aboard ship should conform to the minimum requirements:

- surfaces of all decks and bulkheads in the food processing, serving, and storage areas should be corrosion-free, smooth, easy to clean, and maintained in a clean condition
- all surface materials, equipment and utensils coming into contact with foods should be corrosion-resistant, non-toxic, nonabsorbent, smooth, durable, easy to clean, and approved by the National Sanitation Foundation (NSF)
- equipment must be maintained in a good state of repair and condition.
- cutting and piercing parts of can openers must be kept sharp to minimixe the creation of metal fragments that can contaminate food when a container is opened

- surfaces used for cutting food must be able to be effectively cleaned and sanitized or must be discarded
- all galley areas, especially the cooking areas, should be fire-protected, and provided with adequate ventilation to readily remove smoke, steam, odors, and gases
- all galley equipment should be permanently mounted
- adequate space for cleaning should be available behind and under any permanently mounted equipment
- back-siphonage must be prevented
- all drains must be trapped and should have easily accessible "clean outs"
- waste, particularly food scraps, should be kept in tightly covered sturdy garbage cans
- all galley water must be potable
- maintain adequate lighting in the galley areas
- all cleaning supplies and chemicals should be stored away from food preparation areas

Food Selection and Procurement

To prevent unnecessary discarding of food, menus should be developed and food ordered according to shelf life and anticipated use. Care should be used in selecting food distributors, especially in overseas ports, to assure purchased products are not contaminated. Upon receipt, ensure the following:

- food containers are in good condition (no dents in cans, no holes in plastic or boxes)
- dry goods are inspected for indications of insect infestation
- frozen food is completely frozen and has no indications of being thawed and refrozen
- fresh seafood is properly labeled.
- all refrigerated items are delivered at or below 41^{o} F
- produce is in good condition with no rotting pieces.

Food Storage

Once procured, food should be appropriately stored in areas protected from contamination. Non-refrigerated dry and canned goods should be stored in a location that is clean and dry, free of exposure to splash, dust, or other contamination, at least 15 cm (6 inches) above the floor, and secured for sea. Corrugated cardboard is known for harboring cockroaches and should be removed from the ship as soon as stores are unloaded. Food should not be stored in areas such as living areas, mechanical rooms, near water or sewage lines, or where other sources of contamination are prevalent. Liquids should be stored on lower shelves so other foods will not be damaged if there is a leak. All food should be used “first-in-first-out” to prevent discarding of expired food. Once non-refrigerated foods are removed from the dry stores area and original protective packaging is removed, they must be protected by storage in easily-cleaned vermin-proof containers or bins.

Perishable food must be refrigerated or frozen. Reefers must be maintained at or below 41° F and freezers must be at or below 0° F. Reefers and freezers must have a highly accurate thermometer for temperature control. Temperatures of all reefers and freezers (including galley reefers) should be checked periodically and a log maintained. In reefers, raw animal products must be separated from cooked, ready-to-eat foods and fruits and vegetables. If space is limited, store raw foods on the lowest shelves to prevent them from dripping on other items. If not in the original container, all food must be wrapped or covered and labeled. There should be enough room around food in reefers and freezers to allow air to circulate and maintain all foods at the proper temperature. Once a food has been removed from the freezer and thawed, it must not be refrozen. All food in reefers and freezers must be stowed for sea.

Food Preparation and Handling

Safe food preparation relies on several principles. The three principles are (1) maintaining proper temperatures during thawing, cooking, and holding, (2) cleaning of utensils and surfaces to prevent cross contamination, and (3) proper personal hygiene of food service personnel. There are also some foods that require special attention.

Foods, especially animal products, must be properly thawed. Ideally, products should be thawed in a reefer. A microwave can be used for thawing if the product is going to be immediately cooked. Thawing as part of the cooking process is also acceptable if the required temperature is met. If running water is used, the water must be no warmer than 70ºF and the water must flow freely over the food and into a drain. Consider the ship's water stores before doing this as it can use a lot of water.

Raw animal products should be adequately cooked prior to eating. Specific food temperatures have been established so that the most common organisms are killed. Raw animal foods such as eggs, fish, beef, pork, and poultry must be cooked to these minimum internal temperatures to ensure the safety of served food. The table below provides safe internal temperatures for some common animal products. The temperatures are from the FDA Food Code. Temperatures for additional, less common, food types can be found in the Food Code.

Minimum safe internal temperatures for various hot foods	
Product	Temperatures
Any food cooked in a microwave	165ºF (74ºC)
All foods previously served and cooled that are reheated	165ºF (74ºC) within two hrs
All poultry and game birds	165ºF (74ºC)
Stuffed meats	165ºF (73.9C)
Stuffing containing meats	165ºF (73.9C)
Pork, ham, and bacon	155ºF (68ºC)

Beef roasts (rare)	130ºF (54.4ºC) for two hrs
Beef steaks (rare)	130ºF (54.4ºC) or as per customer request
Commercially raised game animals	145ºF (63ºC)
Fish	145ºF (63ºC)
Unpasteurized shell eggs (not for immediate use)	155ºF (68ºC)
Unpasteurized shell eggs for immediate service	145ºF (63ºC)
Food held for serving (after cooking)	140ºF (60ºC)

Once a food is cooked, it must be maintained at 140ºF until serving. Cold food, such as salad bar items, must be maintained at or below 41ºF. Hot foods to be kept for leftovers must be placed in shallow pans to cool quickly. Leftovers should be 70ºF within two hours and below 41ºF in a total of four hours. Leftovers should not be stored for more than 24 hours and should be covered and labeled to indicate the date and time to discard. When leftovers are reheated, the internal temperature must reach 165ºF.

If possible, foods to be cooked should be prepared in a different area than those that are eaten raw or are ready-to-eat. This will avoid cross contamination. If this is not possible, utensils and cutting boards must be replaced or sanitized between each type of food contact. For example, lettuce for a salad cannot be cut on a cutting board or with a knife that was used to cut raw poultry. If preparation is not separated, salmonella from the poultry will be transferred to the lettuce, which is eaten raw. The crew will become sick.

Raw fruits and vegetables should be washed in potable water before serving to remove pesticides and other contaminants. If fruits and vegetables are procured from countries where human sewage is used for fertilizer, they should be carefully peeled and/or fully cooked before eating. Some difficult to clean foods, such as lettuce, may best be avoided in some foreign ports.

Eggs are often contaminated with salmonella. This organism is killed when eggs are cooked so that cooked egg products are safe to eat. However, pasteurized egg products should be substituted for raw shell eggs in the preparation of foods that do not require cooking such as Caesar salad, hollandaise or bernaise sauces, mayonnaise, eggnog, and ice cream.

Sanitation of Equipment, Utensils and Food Preparation Areas

Equipment, utensils and other food-contact surfaces shall be cleaned to sight and touch. The surfaces of cooking equipment and pans shall be kept free of encrusted grease deposits and other soil accumulations. Non-food-contact surfaces of

equipment shall be kept free of an accumulation of dust, food residue, and other debris.

Equipment food-contact surfaces and utensils shall be cleaned with the following frequency:

- before and after each use with a different type of raw animal food such as beef, fish, lamb, pork, or poultry
- each time there is a change from working with raw foods to working with ready-to-eat foods
- between uses with raw fruits or vegetables and with potentially hazardous food
- at any time during the operation when contamination may have occurred
- if used with potentially hazardous food, equipment food-contact surfaces and utensils should be cleaned throughout the day at least every 4 hours if not maintained below 41^{o}F or above 140^{o}F
- if equipment or utensil had not been used in the past 24 hours, it should be inspected and cleaned/sanitized prior to use if needed
- non-food contact surfaces of equipment and the galley itself should be cleaned at a frequency necessary to preclude accumulation of soil residues
- sponges must not be used in food service areas
- wiping cloths must be stored in a sanitizing solution when not in use and should be replaced frequently
- ice machines and food dispensing machines (such as milk, juice, and ice cream) should be properly maintained and regularly cleaned

To clean: tableware, utensils, and other food contact surfaces must be manually washed in a three-compartment sink or in a ware washing machine and then air dried in a clean area. For manual washing, the first sink is used for washing, the second for rinsing, and the third for sanitizing. For ware washing machines, all large particles of food must be removed prior to loading into the machine. The following sanitizing methods may be used:

- immersion for at least 10 seconds in a solution of 25 ppm chlorine (Cl) and a temperature of 120^{o}F or 50 ppm Cl and 100^{o}F or 100 ppm Cl and 55^{o}F
- immersion for at least 30 seconds in clean hot water at a temperature of at least 171^{o}F
- immersion for at least one minute in a clean solution containing 25 ppm iodine, pH of not higher then 5.0 and a temperature of at least 75^{o}F
- in a ware washing machine that provides a minimum utensil surface temperature of 160^{o}F
- for equipment that is too large for immersion or ware washing machines, treat with steam or rinse, spray, or swab with a chemical sanitizing solution of at least twice the recommended strength of Cl or iodine

POTABLE WATER

Throughout history, safe drinking water has been an essential maritime requirement. Even today, many diarrheal disease outbreaks aboard ship have been traced to contaminated drinking water, often obtained in foreign ports. Care should be taken when procuring drinking water to make certain it is safe. If the ship has potable and non-potable water sources, they should be clearly separated and not interchanged.

Nonpotable water may be used for activities such as bathing, cooling and fire protection. Drinking water supplies should be tested daily for chlorine content and checked weekly for possible biological activity. Plumbing systems should be designed to prevent backflow. This is especially important in galley areas. Cross contamination between drinking water and sewage plumbing systems have lead to disease outbreaks and should be prevented. All sounding tubes and deck water connections should be capped and locked when not in use.

Potable Water Tanks

Potable water tanks must have a suitable lining and should be cleaned and sanitized at least once a year. To sanitize the tanks, the system should be super-chlorinated with 100 milligrams/liter (mg/l) of chlorine for four hours. The system must be flushed with potable water prior to refilling. Any pipes, valves, pumps, etc. that have been dismantled, repaired or replaced must be sanitized in this same method. Tanks should be sanitized after any maintenance, cleaning, or entry for any other reason. If more than one tank requires sanitizing, the highly chlorinated water from the first tank may be used in subsequent tanks, but additional chlorine may need to be added to ensure the 100 mg/l chlorine level is maintained. All parts of the water system must be super-chlorinated after any positive biological testing.

Potable Water Hoses

Potable water hoses should be labeled as such and not used for any other materials. When not in use, the hoses should be stored in a locked locker in a clean area to assure they are not used for other purposes. The ends must be capped or connected to each other to prevent contamination. Prior to first use or any time contamination is suspected, they should be sanitized as described for water tanks. Before connecting potable water hoses to shore connections, sanitize the shore connection with a solution of 100 mg/l chlorine.

PEST MANAGEMENT

Throughout maritime history, ship's crews and inhabitants of ports have been incapacitated and decimated by vector-borne diseases. In extreme circumstances, quarantine of an infected or infested vessel has been known to have caused a loss to the company of a year's income, while acquiring new clearance papers. Common shipboard vectors include rats, mosquitoes, flies, bedbugs, lice, ticks, and cockroaches. Pest management is important to the health and well-being of shipboard personnel and is needed to protect property and resources.

Ideally, ships should seek to minimize reliance on chemical pest control procedures and the adverse health effects of pesticides. Integrated pest management (IPM) is a comprehensive approach to pest control and prevention that considers all available strategies, including mechanical, cultural, biological, and chemical techniques. Non-chemical pest controls, such as good sanitation practices and the elimination of pest harborages and access, should be implemented prior to use of any chemical control measures.

Pesticides

Pesticide applicators should be trained and certified when Environmental Protection Agency (EPA) restricted-use pesticides are being applied. A log and/or file should be maintained to indicate the type, quantity, and location applied for any pesticides used onboard. Procedures should be consistent with the Federal Insecticide, Fungicide and Rodenticide Act, EPA and Occupational Safety and Health (OSHA) standards. Pesticides are hazardous materials and a Material Safety Data Sheet (MSDS) should be maintained on hand for any pesticides available for use. Follow all precautions and recommendations of the manufacturer as described in the MSDS. The container labeling will also provide important safety information. All chemicals that are used to control vectors should be kept in their original containers, properly labeled and securely stored away from food (stores and cargo).

Rodents

Rats on a ship are a health menace and a nuisance. They cause extensive damage to cargo and food, and rat droppings contain organisms which produce diseases. Rats carry fleas which may transmit plague and murine typhus. Because of these dangers, ships heavily infested with rats must be fumigated, and fumigation is a laborious, expensive, and dangerous procedure. It can be avoided through adequate rat-control measures. A deratization exemption certificate provided after an inspection that demonstrated the ship was rodent-free is required for some ports. The ship's agent should be able to make arrangements for an inspection to receive this certificate.

Despite reasonable precautions by the ship's personnel and port authorities, some rats may get aboard. However, infestation can be avoided. The following are guidelines to prevent and control rodents onboard ship:

- when moored, use approved and properly installed rat guards on all ship-shore lines to prevent rodents from getting aboard via these lines
- frequently inspect for signs of rat life (trails or runs marked by dirt or droppings) and take quick action if evidence is found
- rat proofing the ship, thus "building out" the rats by elimination of their living places or harborages
- keeping all food protected and avoiding accumulation of food scraps and garbage, thus "starving out" the rodents

- killing them by trapping or expert fumigation by personnel from authorized agencies (general use of rodenticide is not recommended as rats will ingest poison and likely die in an inaccessible area and cause additional sanitation problems and odors)

Flies

Domestics flies, some of which bite, can transmit enteric (intestinal) diseases to man. Their larvae and eggs may infest human intestines as well as stored food. The primary method of control is good sanitation and control of waste. All waste must be stored in cans with tight lids. If chemical controls are used, non-residual aerosols (space sprays), residual and microencapsulated insecticides, and baits are the most effective against flies. When there is a fire hazard or heat source, non-flammable propellants must be used. When spraying in food preparation and serving areas, conduct operations when the galley can be closed for several hours, remove all food, and clean all surfaces prior to returning food to the galley.

Mosquitoes

Several species of mosquitoes may transmit encephalitis, malaria, yellow fever, filariasis, West Nile Virus and other diseases. The primary method of control is to remove all standing water so the larvae can not survive. Methods as noted above for fly control can be used if chemicals are deemed necessary.

Roaches

Roaches produce unpleasant odors, transmit diarrhea and dysentery, and damage food stores. Primary controls are good sanitation practices, elimination of cracks, crevices and dead spaces, storing food and garbage properly, watching for, and destroying all cockroaches and their egg cases, and removing corrugated cardboard boxes and cartons from provision storerooms as soon as possible. Bait stations and glue traps should be the first chemical controls used for minor infestations. If a larger infestation is suspected, a certified pesticide applicator should spray cracks and crevices with an appropriate insecticide. Follow precautions noted above under fly control when applying pesticides in food handling areas.

Lice, Bedbugs, and Fleas

These ectoparasites live on the outside of the body, cause discomfort, and may transmit disease. Good personal hygiene and frequent laundering of clothing and bedding are the primary methods of control. Additional control methods include keeping berthing areas clean by vacuuming floors, rugs, and upholstered furniture; watching for, and eliminating ectoparasites introduced with luggage and clothing; avoiding furniture with wood-to-wood joints; and avoiding pillows or mattresses with rolled seams; and elimination of rodents. For personal infestations, use insecticide powders prescribed by a physician. Over the counter treatments are available for bedding and clothing. Be extra careful with pesticide use on bedding and in berthing areas. Follow all product directions.

Pests in Stored Products

These pests (cockroaches, beetles, moths, ants, mites, silverfish, spring tails) damage clothing and rugs and ruin many millions of dollars worth of stored foods annually. They reproduce and transmit human diseases. The primary control method is good sanitation and thoroughly inspecting food products when they are delivered. Store foods and products in an orderly, sanitary manner in a cool, dry room on racks up above the floor, use old stocks first, inspect stocks regularly and dispose of any found to be infested. Be careful when using insecticides around food, even in storage areas. Vapors from pesticides can infiltrate packaging and contaminate food products.

GARBAGE

Liquid and solid wastes are generated during regular ship operations. Wastes must be properly stored and discharged according to environmental regulations. Garbage and trash should be stored separately. Care should be taken so that other ship areas are not contaminated. Receptacles should be covered to prevent entry of flies and other insects. Geographic-specific ocean dumping regulations for liquid and solid wastes must be followed. When practical, paper, cans, bottles and other items should be recycled.

LAUNDRY

Laundry facilities should be maintained in a clean and sanitary condition. Floors should be cleaned at least once daily by dustless methods. Lint must be removed as necessary from bulkheads, overheads, and supporting members to prevent a build-up and possible fire hazard. After each use remove lint from washers and dryers. Vehicles or containers used to hold unwashed laundry must be cleaned frequently. Unwashed clothes should not be handled in close proximity to clean clothes.

Plumbing fixtures should be properly installed and secured for sea, maintained in good repair, and kept in a sanitary condition. All fixtures and appliances must be provided with backflow prevention devices. Ensure there is no cross-connection between gray water and the potable water supply. Seawater must not be used for laundry facilities when the ship is in polluted waters. Maintain adequate illumination.

Members working in laundry areas shall be briefed on the hazards of their duties and on the importance of proper personal hygiene. Frequent hand washing is required, especially after using the toilet. Eating, drinking (other than water), cooking, smoking, and storage of food, drinks, or smoking materials should not be allowed in the laundry room. Heat stress conditions may be present in the laundry room. Provide personnel with adequate drinking water and ensure ventilation is operating properly to reduce humidity levels and provide fresh air.

BARBERSHOPS

Ensure that personnel performing barbershop duties are free of any communicable disease. Personnel must maintain good personal hygiene and wear clean clothing when attending customers. Hands must be thoroughly washed with soap and hot water between customers. Personnel should not eat, drink, or smoke while attending customers. Do not provide services to persons with inflamed or infectious conditions of the scalp, face, or neck unless they have been evaluated by the medical department representative (MDR). Therapeutic practices such as treating pimples, ingrown hairs, etc. should not be performed. Only materials and procedures approved by the MDR should be used to stop the flow of blood in case of nicks.

Only use tonics, lotions, bleaches, dyes, etc. that have been approved by the Food and Drug Administration (FDA). All instruments that come into direct contact with customers must be cleaned and disinfected between uses. Only Environmental Protection Agency/FDA approved disinfectants and sanitizing agents should be used. Read product directions and follow them. Personnel should not use common brushes, dusters, etc. Shaving should not be allowed. Sanitary neck strips should be used for each customer and soiled capes should be laundered before reuse. Remove cut hair from the decks frequently by dustless methods.

HABITABILITY

There should be a regular cleaning schedule for all berthing areas, heads, and showers aboard ship. These areas must be kept clean, operable, well ventilated and well illuminated at all times. Mops, brooms, and other cleaning gear should be cleaned and properly stowed away from the berthing area after use. To prevent pest problems, food items should not be allowed in berthing areas. The Master or his designee should perform regular inspections to ensure safety and cleanliness of berthing areas, heads, and showers.

THERMAL STRESS

Heat stress conditions are a common problem onboard ship. Cold stress could be an issue while operating during the winter in cold climates.

All personnel should be trained in the symptoms and proper treatment of heat stress, heat exhaustion, and heat stroke. This will allow them to protect their own health and that of fellow shipmates. Thermometers should be placed in all areas that are potential heat stress locations such as the engine room, auxiliary machinery rooms, laundry, galley, and scullery. These thermometers should be checked periodically to determine if there is a potential for heat stress problems. The MDR should have a wet bulb globe temperature (WGBT) meter available to evaluate heat stress conditions.

Ensure cool drinking water is continuously available in areas where heat stress conditions or their potential exist. Good nutrition, three meals a day is equally

important, work schedules should facilitate adequate sleep. Salt added to meals is normally sufficient and salt tablets are not necessary unless recommended by the MDR.

Cold stress is primarily prevented by keeping dry and wearing plenty of clothing. Wind chill can dramatically decrease the perceived temperature. Personnel should be trained on the physiological effects and proper recognition and treatment of cold injuries.

HAZARDOUS MATERIALS

Hazardous materials include a variety of materials onboard ship from oils to paints and cleaning supplies. Material Safety Data Sheets (MSDS) are available for all hazardous materials. Personnel who use the materials should be trained on the content of the MSDS. An inventory of hazardous materials should also be available. MSDS's should be provided when the material is purchased. Contact the manufacturer or distributor of the material if a MSDS is missing. The MSDS will provide information on content, exposure limits, health effects, actions to take in case of a spill, personal protective equipment to use, conditions and materials to avoid, proper storage methods, fire precautions, and more. It is important to ensure personnel have the personal protective equipment available to safely use any hazardous material. Provide adequate ventilation as possible in areas where hazardous materials are used. OSHA regulations, 29 CFR 1910.1200 and 1910.120 provide information and guidance on hazardous materials.

OSHA documents can be found at:
www.osha.gov or. www.access.gpo.gov/nara/cfr/index.html

RESPIRATORY PROTECTION

The use of respirators is sometimes required. Any person who plans to use a respirator onboard must be properly trained and fit tested and medically evaluated prior to use. It is also important to select the appropriate respirator for the task. OSHA regulations, 29 CFR 1910.134, provides detailed information on the proper selection, training, fit testing, and medical evaluation of personnel.

CONFINED/ENCLOSED SPACES

There are a variety of confined spaces aboard ship. A confined or enclosed space is any space that has limited escape routes, is not intended for human occupancy, has limited ventilation, or has a potential for atmospheric hazards. These spaces must be evaluated by a qualified person with calibrated equipment prior to entry by any personnel. Detailed guidance can be found in OSHA regulation 29 CFR Part 1915.

RECOMMENDED REFERENCES

Environmental Engineering And Sanitation, Salvado, J.A., Wiley-Interscience, (most recent edition)

Control Of Communicable Diseases Manual, Edited By Chin, J., Apha, (most recent edition)

Threshold Limit Values For Chemical Substances And Physical Agents And Biological Exposure Indices, Acgih (Updated Annually)

Emergency Care For Hazardous Materials Exposure By Bronstein, A. C. And Currance, P. L., Mosby Lifeline Press, St. Louis, (most recent edition)

Additional Guidance For The Subjects In This Chapter Can Be Found At The Following Web Links:

Virtual Navy Hospital, Manual Of Naval Preventive Medicine: http://www.vnh.org/PreventiveMedicine/PreventiveMedicine.html

U.S. Navy Shipboard Pest Management Manual: Http://Www.Vnh.Org/Pestcontrol/

Occupational Safety And Health Administration: Www.Osha.Gov

National Institute Of Safety And Occupational Health: Www.Cdc.Gov/Niosh

Code Of Federal Regulations: Http://Www.Access.Gpo.Gov/Nara/Cfr/Index.Html

Environmental Protection Agency: Http://Www.Epa.Gov

Food And Drug Administration: Http://Www.Fda.Gov

Centers For Disease Control And Prevention: Http://Www.Cdc.Gov